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American Heating



Poisoning
the Air.





Poisoning the Air.

THE AIR IN OUR LIVING AND SLEEPING ROOMS. HOW IT IS POISON-
ED BY THE USE OF THE ORDINARY COAL OIL STOVE, GAS
STOVE OR RADIATOR, OR GASOLINE STOVE. THE PRODUCTS
OF COMBUSTION FROM THE BURNING FLAME, THE CAR-
BON MONOXIDE AND THE CARBON DIOXIDE, DEADLY
POISONS, ODORLESS, INVISIBLE, TASTELESS AND
COLORLESS. THEY KILL QUICKLY, AND WHY.
ANIMALS ON THE FLOOR OF THE ROOM IN-
HALED THESE POISONS DIED QUICKLY.
CHILDREN AND WIFE UNCONSCIOUS
AND NEARLY DEAD. BUSINESS
MEN POISONED, STUPEFIED,
UNABLE TO THINK. ❖ ❖

The oil stove, the gas stove, and the gasoline stove are *generators of a deadly poison*; and of late years, the custom of heating rooms by these devices has become more and more common. The practicing physician of to-day, in his rounds, is constantly meeting with these devices for heating rooms, (and especially among some people) for heating sick rooms. The intelligent physician is constantly obliged to take immediate action to have these deleterious instruments removed in short order.

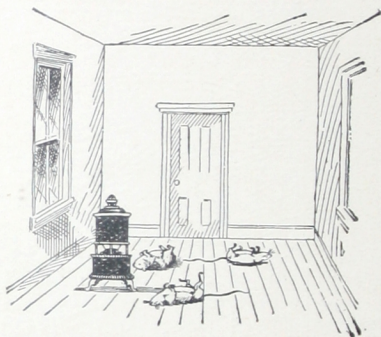
The popularity of these stoves is due to four things: First, their cheapness; second, no coal or ashes to carry; third, ease of making the fire; and fourth, portability.

Most persons who have used them complained more or less of their ill effects upon the health, but few seem to realize the extent of the *danger* and *damage to health* that these devices necessarily inflict.

In order to properly understand this subject, it is necessary to have a clear idea of the nature of combustion, the character of the fuel burned and the products of combustion. Whether the fuel used be coal oil, coal gas, charcoal or gasoline, the results are practically the same, so far as the *generation of poison* is concerned and its effects upon the health, when *no exit* is provided for carrying off the products of combustion and preventing its escape into the room that is being occupied. The ordinary wood fires and coal fires that are in the chimney place or in a stove, with a large pipe connecting with the chimney have always been thus provided with an exit for the products of combustion; because the creosote, pyrogallic acid and other irritants in the wood compelled the person using them to provide an exit, for the eyes and throat would be quickly irritated long before the principal poisons produced could effect the system. The same is true of coal, exit has always been provided for the gases and products of combustion from coal fires, for the sulphur in the coal usually manifests itself

quickly by irritating the eyes and air passages, so that the occupant of the room would immediately become cognizant of the presence of an irritating gas, and would realize the necessity of providing for its escape.

The most *deadly poisons* however, that are produced by the combustion of the various kinds of fuel in use are *not irritating* and are *invisible*, have *little or no perceptible smell*, and consequently their presence is *least suspected*. Now, since illuminating gas, coal oil and gasoline do not produce the irritants like wood or coal fires, the idea has seemed to prevail that there is therefore little or no poison produced and *little danger in allowing the products of combustion* to escape into the atmosphere of the room. This, however, is a *grave mistake*. The *most poisonous gas generated* from coal oil, gasoline or gas is known to chemists as *carbon monoxide*, and is *invisible, colorless, odorless and tasteless*, and yet *five per cent.* of it in the atmosphere is absolutely *fatal* to animal life in a short time. The other most poisonous gas, *carbon dioxide*, has a very slight odor. Its presence in the room is *scarcely perceptible*, and yet it is a *deadly poison*. When the monoxide and dioxide are mixed, as they usually are in the products of combustion, their *poisonous properties* seem to be *enhanced*.



If a person were to be enclosed in a tight room for a few hours with a large heater of this kind, where the crevices of the doors and windows and key holes were not permitted to admit fresh air or to be opened, *death* would inevitably result. In fact, in France, it became a fad among suicides to start a fire in a brazier's bucket of charcoal, a form of carbon,

and lying down in the room and breathing the carbon dioxide and carbon monoxide, and permitted themselves to be lulled into a narcotic sleep from which there was no awakening. A striking illustration of the effects of the products of combustion may be made by placing a coal oil stove, gas stove or lamp in a small room or box in which are confined a number of small animals, such as guinea pigs or rats, and as the oxygen is consumed by the fire and is replaced by the carbonic acid or carbon dioxide, the animals will be all found dead in a few hours.

When these poisonous gases are generated from fuel, even when they contain irritants, persons occupying the room become gradually accustomed to their presence, so that very often poisonous gases are not detected by the in-

mates of the room, even though a person coming in from the fresh air would find them almost intolerable on entering the room. This inability to detect the presence of poisonous gases, of course, is especially marked during sleep. I have sometimes been told by persons who used these objectionable and dangerous heating devices that they never had any trouble with them, but that they always turned the fire out before going to sleep, thus showing that they seemed to realize that there was *danger*, and did not care to be caught by it while napping. Some years ago, I saw a family of three children that *were poisoned*, two of them to insensibility, while the older one, a boy, was staggering around trying to get the door open, when the mother, who had left them closed up in a little parlor, returned and found the two younger ones, a baby of about two years and one of four years, on the floor *unconscious*. Prompt treatment and fresh air restored them.



Very recently I saw a somewhat similar instance where a *man and his wife were poisoned by these products of combustion during the night*. The man awoke in a semi-conscious condition and succeeded in opening the windows and doors and getting his wife out of bed. She staggered to a lounge where I found her in a deeply *narcotized condition*.

Carbonic acid or carbon monoxide, or a mixture of these is an active poison to animal life and a powerful narcotic, not an irritant poison. Its action seems to be most marked on the nervous system and on the blood. It may cause asphyxia, by its action apparently upon the respiratory centres and upon the blood. The lungs of persons who lie down in its fumes, as tramps

who fall asleep in the warmth of lime kilns, and suicides who deliberately lock themselves in rooms with burning charcoal, and pass into coma ending in death, are passively congested. In the autopsies described* by Guerard, the heart and lungs were filled with dark blood. If the death is caused by pure monoxide of carbon gas, the blood will be a lighter color.

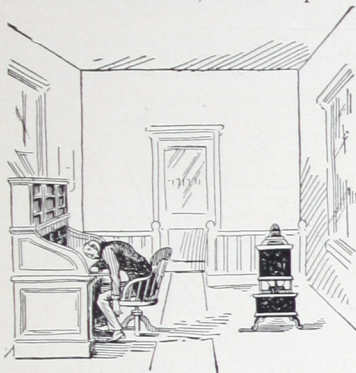
Among the *early symptoms* from small doses of these poisons are *giddiness, headache, hyper-æsthesia, nausea and vomiting*. In the *advanced stages of poisoning, convulsions* may occur, *slowing of the pulse and respiration*

The gases being imperceptible to the senses, are exceedingly *insidious poisons*. In case of severe poisoning by the inhalation of the products of combustion of fuel containing large quantities of carbon, of course the lungs should be immediately filled with oxygen, or, if this is not obtainable, pure air, the removal of the person from the presence of the poison, and the immediate summoning of a physician.

What we are about to say of oil, for all practical purposes, may be considered as applying to gasoline and coal gas, or illuminating gas, so far as the production of the poison and its effects on the system are concerned. They are all composed of carbon and hydrogen largely, and as they burn, the oxygen of the air in the room unites with the carbon and hydrogen, forming, as we have said before, carbon monoxide, carbon dioxide and hydrogen oxide, or water, in a state of vapor or steam. This steam generated in a room is also very objectionable for the reason that it saturates the paper and furniture with moisture, which is conducive to mould and the propagation of bacteria, and which may be seen running down the windows in cold weather in streams.

A quart of coal oil contains twenty-four ounces of carbon, and during the process of burning produces about fifty cubic feet of carbonic acid and carbonic oxide, or carbon monoxide and carbon dioxide. Now, a room thirteen by fifteen feet and eight feet high contains about fifteen hundred cubic feet of air, which is normally one-fifth oxygen and four-fifths nitrogen, and therefore contains about three hundred feet of oxygen. By the use of such stove we have not only the production of a poisonous gas, but we have the *rapid destruction of the oxygen* in the room, and *without oxygen life is impossible*. It would take about a gallon and a half of coal oil to consume all the oxygen in the room, provided no fresh air was admitted and that the flame was not extinguished for want of oxygen; and thus the three hundred cubic feet of oxygen would be converted into, or displaced by, about three hundred cubic feet of the poisonous oxides of carbon gases. It may be readily seen, therefore, that it is by the constant, and, as it were accidental admission of fresh air into the rooms that are heated by these devices which throw the products of combustion into the room,

that permits anyone to come out alive, for the reason that there would be no oxygen in the room and there would be twenty per cent. of poisonous gas taking its place; and as experiments have shown, as above stated, that five per cent. and even less, of these poisons, are *fatal* to life.



So that it is no wonder, when we consider these incontrovertible facts of chemistry and physiology, that we find the business or professional man whose office is thus heated incapable of healthy mental action, and vainly seeking for ideas which do not arrive until after he has taken a walk in the fresh air; and the invalid whose room is thus heated sinking into a more profound

state of prostration and debility, and frequently the members of the household complaining of various nervous diseases and headache, and showing a persistent degeneration of the constituents of the blood and nervous system.

Intelligent persons who value their health will not think of using a heating apparatus which throws the products of combustion into the room.

DOWLING BENJAMIN, M. D.

A Strong Endorsement.

The foregoing article was in part published in the North American, of Philadelphia, Pa., in its issue of February 1st, 1901. It was contributed by Dr. Dowling Benjamin, of Camden, New Jersey, who is one of America's most eminent physicians and surgeons. His reputation as a writer on medico-sanitary questions has become international. He is identified with National, Inter-national and State Sanitary Associations. Has been Medical Expert and Surgeon for the Penna. R. R. Co., for 15 years. He is a scientist as well as a physician. He has been Medical Expert in murder and other court trials. He has filled lectureships in Medical Colleges and is now filling a number of important positions as physician and surgeon in various institutions, including the Cooper Hospital of Camden.

After the publication of the article in the *North American* the following correspondence between the Office of the American Heat, Light and Power Co., and Dr. Benjamin took place:

Dr. Dowling Benjamin, Philadelphia, February 23, 1901.
215 Cooper St., Camden, N. J.

Dear Sir:—In a recent issue of the *North American* we notice a contribution from you bearing upon the use of the ordinary coal oil and gas heating devices, in living and sleeping rooms, and their injurious effects upon the health of the people.

We are manufacturing the AMERICAN SANITARY GAS AND OIL HEATERS which we claim entirely meet all the conditions of your restrictions, as set forth in the article referred to *purifying the air of the room while heating it*. We cordially invite you to call at our office, 2322 Columbia Ave., this City,—see these heaters in practical operation, make personal examination into our claims for them and make your own tests as to their merits. We have equipped the office to facilitate such tests. We will be pleased to have you make an appointment for such examination at your earliest possible convenience and so advise us.

Yours truly,

AMERICAN HEAT, LIGHT & POWER COMPANY.

Camden, N. J., February 25, 1901.

American Heat, Light & Power Co.

Gentleman:—Your letter received and noted. You refer to an article of mine published in the *North American*, February 1st. Many people have transmitted their thanks to me for this publication. Much relating to observations of cases in my practice, illustrating the principles involved, was omitted by the Editor, in the published article. I herewith send you the entire original article for examination, and publication if you so desire.

If you have devised a gas or oil stove that is free from the objectional features which I pointed out in this article, it will be a great benefit to the public generally, for I find the use of the present style of these devices to be injurious to the people and especially to my patients.

I shall take great pleasure in making an examination of your Sanitary Gas and Oil Heaters, as you suggest, and make an appointment for such purpose at 4 P. M. on February 26th.

Yours truly,

DOWLING BENJAMIN, M. D.

Dr. Benjamin's Report.

I take pleasure in stating that, as per the engagement made in my letter of February 25th, 1901, I made on February 26th, a careful examination of the *American Sanitary Heater* and a *series of rigid scientific tests* to determine the *purity or impurity of the atmosphere in the room* where it was in use, and as a result I found *no traces of impurities*, but found a large volume of *pure fresh air pleasantly heated* passing from the heater into the room where it was in use.

I also found that not only the *products of combustion* from the burning flame, but all *other foul and impure air*, such as result from the breathing of the occupants, or other sources, are *thoroughly and completely removed* from the room by the *operations of the heater*.

I also found that there is a *constant and rapid circulation of pure heated air* in the room, thereby securing a re-

markable *evenness of temperature* in every part of the room where this heater is in operation. The difference in temperature between the ceiling and the floor was about four degrees, while the thermometers at the most distant points from the heater and that near-by were *nominally the same*.

I also made a thorough test with one of the *coal oil heaters* in my bath room. In this I made a *special test* to ascertain the *presence of carbonic acid gas*, but I failed to find the *slightest traces* of its presence. In addition to this I also found that it not only furnished a very *uniform temperature* in the room but removed *all foul and disagreeable odors* and supplied a peculiarly *fresh and healthy atmosphere*.

In view of the *remarkable and striking results* of these tests, I can state that this heater *more than covers* all the *claims made for it*, and that it *entirely covers* the *objections and restrictions* I made, as against the use of the ordinary coal oil and gas heaters, in the article which was, in part published in the North American on February 1st.

I, therefore, most cheerfully and heartily *endorse* the heater for use in *living and sleeping rooms* and especially for the *sick room* of the people, and urgently commend it to the favorable consideration of the general public and the medical profession.

DOWLING BENJAMIN, M. D.

These are the Heaters.



GAS HEATER.

These are the Heaters so strongly endorsed in the foregoing report of Dr. Benjamin. These Heaters are constructed in two sizes, No. 1 and No. 2. No. 1 is suited for either gas or coal oil as fuel. It will heat from 3000 to 3500 cubic feet of air. The price of the No. 1, for either gas or coal oil complete is \$15.00.

The No. 2 is larger and will heat about 6000 cubic feet of air. At present it is only constructed for gas as fuel. The price of this No. 2 complete is \$21.00.

Whether gas or coal oil is used as fuel there are absolutely no odors or poisonous gases circulated in the room where these heaters are in operation. These are conducted through the fumes pipe, out of the room to the chimney. These heaters are economical in use as the heat generated from the fuel is evenly distributed in all

parts of the room including the lower portion or living part of the room. The fresh air introduced into the room is heated before being distributed. In this way a large per cent. of fuel is saved.

Style B.



OIL HEATER.

the single heater in the room.

It is suited to heat the parlor, dining room and hall on the first floor. In this way all the advantages of the room heater are secured with no obstruction in the room.

In cases where the system, in use, does not furnish sufficient heat, this heater will not only reinforce the heat of the entire house if placed underneath the hall, but will distribute the general heat uniformly over the house and will purify the air. In this way a large per cent. of the fuel, otherwise consumed, can be saved.

It is especially suited for *spring* and *fall* heat. It will heat the whole house in the fall, before the other heating devices are in operation, and when they are suspended in the spring.

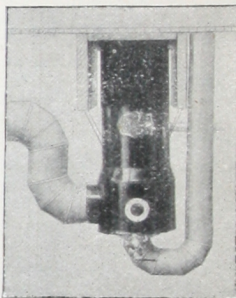
Write for information, or see demonstration at the office of the

American Heat, Light and Power Co.

Philadelphia Office,

2322 COLUMBIA AVENUE.

This style is designated as B, No. 1 and No. 2. While in appearance this style differs from the other, it is constructed upon precisely the same principles and the operation is the same. This heater is fastened to the ceiling in the cellar. The foul air is drawn from the floor of the room just above it and is passed through the burner and carried out through the fumes pipe to the chimney, the same as if the heater were standing in the room. Fresh air is conducted from the outside to the heater and thence through the register in the floor above it into the room. It purifies the air in the room, hall, or the house above it the same as



STYLE B.

